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US presidential elections and real GDP growth, 1961–2004

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Abstract In this paper I show that, since 1960, an electoral cycle in US output growth can both be seen by the naked eye in the raw data and confirmed by a statistical analysis that allows for rational partisan effects as well as a wide range of control variables. That is, controlling for multiple lags of interest rate changes, inflation, money growth, energy prices, lagged output growth, government spending (or its growth) and temporary partisan effects, the timing of elections exerts a significant influence on quarterly real GDP growth.

Keywords Political business cycle · Monetary economics · Presidential elections

JEL Classification E6 · E32 · P16

1 Introduction

The political business cycle (hereafter, PBC) literature seems to have reached a consensus, namely that there are opportunistic cycles in policy variables that appear more strongly in developing than developed countries, but no corresponding cycles in real macro outcome variables like unemployment or output.[1] At the same time, Alberto Alesina and various co-authors (Alesina 1987, 1989; Alesina and Rosenthal 1989; Alesina and Roubini 1992; Alesina et al. 1992, 1997, hereafter Alesina et al.) have made the case that there are temporary partisan electoral effects on real outcomes. They argue further that any empirical

[1] With respect to macro outcomes, McCallum (1978), Paldam (1979), Golden and Porterba (1980), Beck (1982), Alt (1985), and Hibbs (1977) all fail to find direct evidence in favor of an opportunistic PBC. Nordhaus (1989), Haynes and Stone (1989, 1990) and Krause (2005) do report favorable evidence but none of these papers account for the critiques of either Alesina or Faust and Irons (discussed below).

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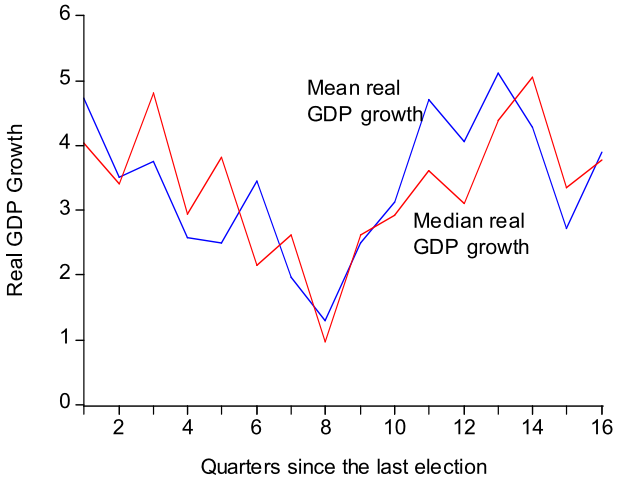

Fig. 1 Mean and median real GDP growth by quarter of the election cycle, 1961–2004

evidence of opportunistic effects can be discounted because un-modeled temporary partisan effects can look like opportunistic cycles.[2] This has become more or less the accepted wisdom on the topic.

Faust and Irons (1999, hereafter FI) argue that Alesina's evidence suffers from a seriously under-specified regression model and the endogeneity of key included regressors. They conclude that there is no convincing evidence for *any* electoral influence, whether it be opportunistic or partisan, on the US economy.

In this paper I show that, since 1960, an electoral cycle in US output growth can both be seen by the naked eye in the raw data and confirmed by a statistical analysis that allows for rational partisan effects as well as a wide range of control variables. That is, controlling for multiple lags of interest rate changes, inflation, money growth, energy prices, lagged output growth, government spending (or its growth) and temporary partisan effects, the timing of elections exerts a significant influence on quarterly real GDP growth. In an accompanying appendix, I show the same results obtain using the de-trended levels of real GDP and the macro variables.

This is the first evidence in favor of opportunistic PBC behavior in macro outcomes in the USA that accounts for both the Alesina and FI critiques and the first evidence in favor of temporary partisan effects on US output growth that allows for their endogeneity.

In what follows, I begin by taking a look at the raw data. Then I discuss the methods of Alesina et al. and FI. Subsequently, I undertake a statistical exercise that addresses many of FI's points in the familiar context of a single-equation model. I further consider whether the estimated effect varies by the outcome of the election (incumbent party wins or loses) and present results that allow Alesina et al.'s temporary partisan variables to be endogenous.

Figure 1 is our point of departure. This graph presents quarterly real GDP growth using data from the last 11 full presidential electoral cycles.[3] Note that growth declines from around 5% immediately after the election to a little over 1% at the midterm, then rises

[2]This is because when a Republican wins (which they often do), the Alesina model predicts a decline in growth after the election and a return to normalcy later in the terms. If the partisan effects are ignored, the data will tend to falsely show a PBC.

[3]The data is quarter to quarter growth of real GDP taken from the St. Louis Fed's FRED database. It is seasonally adjusted.

back to around 5% by the 14th quarter of the 16-period cycle. This pattern is clearly evident in both the means and medians and bears a startling resemblance to what one might conjure up if asked to draw an idealized political business cycle.[4]

Of course, as noted above, Alesina et al. would argue that this pattern is what one would expect from their partisan model when the conservative party wins a majority of the elections, so the graph in itself cannot be taken as proof of opportunistic cycles. I will next construct a statistical model of real GDP growth and formally test for the existence of PBC effects controlling for temporary partisan effects and a wide range of macro variables. My approach will thus be a hybrid between Alesina et al. and FI, and I begin by summarizing each.

2 Recent methods in PBC research

As is well known, modern theories of political cycles can be classified in a two-by-two matrix. There are ideological (usually called partisan) and opportunistic models with both traditional and "rational" versions of each. This classification appears in Alesina et al. (1997) and the models are discussed extensively in Drazen's (2000) book as well. The ideological, or party policy differences, model is originally due to Hibbs (1977). He argued that differing party preferences can have permanent effects on output. Chappell and Keech (1986) and Alesina (1987) modify the theory using rational expectations and a macro model along the lines of Fischer (1977). Their work predicts that the real effects of party differences will be temporary and occur shortly after an uncertain election. The opportunistic PBC model was first formalized by Nordhaus (1975) and MacRae (1977). This too has been modified by a number of authors (e.g., Rogoff 1990; Persson and Tabellini 1991) using rational expectations, a macro model along the lines of Lucas (1973), Blomberg and Hess (2003), and a signaling game with imperfect or asymmetric information. As my aim is to reverse one of the stylized facts of the literature, I do not undertake a long review of the theories but instead concentrate on the state of the empirical evidence.[5]

In his book, Drazen (2000) argues that "taken as a whole, the econometric evidence presents a case for the existence of some opportunistic, pre-electoral manipulation of economic policy, and for the effects of that manipulation perhaps on inflation, but not on economic activity." When discussing partisan models Drazen points to "a partisan pattern for real GDP growth rates both in the Unites States and in numerous other countries. There are also partisan effects in inflation and in money growth rates." This is a fair representation of the accepted stylized facts: mixed evidence for opportunistic cycles in policy variables, little to no evidence in macroeconomic outcomes, and a significant pattern of partisan effects on macro outcomes.

However, Faust and Irons (1999) argue that virtually any positive results for the United States arise from incorrect statistical practice. They criticize the Alesina et al. approach for failing to include relevant control variables and for ignoring the endogeneity of the party that wins the election. As they put it, "Most earlier work investigates one macroeconomic

[4] According to Fair (1998), output growth 2 or 3 quarters before the election is the economic variable that best predicts presidential voting. Figure A.1 in the Appendix shows the same basic pattern in the cyclical levels of real GDP.

[5] While the opportunistic and partisan theories are often developed in isolation, they are not actually mutually exclusive. I will show evidence consistent with the existence of both types of effects. Brock and Hess (2003) and especially Sieg (2006) present theoretical models that incorporate both types of behavior.

variable at a time and treats the party in power as exogenous. Such work implicitly assumes that there is no causality from the economy to the party in power. By leaving out of the equation important determinants of both economic activity and the party in power, the work can be badly biased."

FI use a four-variable vector autoregression (VAR) of money, output, prices, and the interest rate with six lags of each variable, plus other control variables and political dummies.[6] However, since reduced-form VARs are estimated one at a time with OLS, we can easily estimate and study a single-equation analog of their output equation. However, to preserve comparisons to most of the PBC literature, I will use the growth rates of each variable rather than their levels as FI do, though the Appendix shows the same basic results hold using de-trended levels as well.[7]

FI heavily parameterize the political effects. They start out with 34 political dummy variables (one for each quarter of the cycle for each party and one each for what party is in power) and then apparently reduce these to 21 dummies in the actual estimations. To the best of my knowledge, FI never actually test for an opportunistic cycle independent of party.[8]

3 My experimental design

In this paper I use a wide range of variables with several lags for each (as in FI) in a single-equation specification of output growth (as in Alesina et al.). I model the PBC with two different variables and I include dummy variables for Alesina et al. style temporary partisan effects. Later on in the paper, I will also attempt to account for the potential endogeneity of those partisan effects. Specifically I estimate equations of the general form:

$$\Delta \ln(Y_t) = \delta + \Sigma\beta_i \Delta \ln(Y_{t-i}) + \Sigma\lambda_i \Delta \ln(P_{t-i}) + \Sigma\theta_i \Delta \ln(R_{t-i}) + \Sigma\Theta\beta_i \Delta \ln(M_{t-i}) + \Sigma\Phi_i \Delta \ln(E_{t-i}) + \Sigma\Psi_i \Delta \ln(\mathrm{GOV}_{t-i}) + \Sigma\gamma_i(\mathrm{POL}_{it}) + \Sigma\phi_i(\mathrm{OTHER}_{it}) + \epsilon_{it}, \quad (1)$$

where Y is real GDP, P is the GDP deflator, R is the federal funds rate, M is a broad monetary aggregate (M2), E is the relative price of energy (defined as the consumer price index for energy divided by the price index for GDP), and GOV is government spending as a fraction of GDP.[9] All of these economic variables are taken from the FREDII database sponsored by the Federal Reserve Bank of St. Louis and summary statistics for them are given in the data appendix. POL is shorthand for the political variables I will enter, and OTHER is shorthand for some additional control variables used by FI. I now discuss the exact form of these variables.

I consider two distinct opportunistic PBC variables. The first, ELE6, is a dummy variable that is equal to 1 the five quarters before, and the quarter of, the election and 0 otherwise.

[6] They also include three seasonal dummies and three dummies to capture the effects of credit controls in 1980.

[7] It is worth noting that most of the PBC literature considers growth rates, rather than levels, and that Ray Fair's (see for example Fair 1998) work on how the economy affects presidential voting shows that it is growth rates that people take into account when voting.

[8] It is worth noting that opportunistic PBC variables based on the timing of the election are immune to the FI endogeneity critique, at least in countries like the United States with fixed election dates.

[9] POL represents the political variables that we will discuss below, while OTHER represents the dummy variables I include for compatibility with FI. They are also discussed below.

This variable is quite similar to those used without success by Alesina et al. The second, ELEFULL, describes a V-shaped 16-quarter cycle with the trough at the midterm election quarter.[10]

I also include variables to test for temporary partisan effects. FIRST is a dummy variable that equals 1 for the first eight quarters of each presidential term and 0 in all other periods, while FIRSTDEM is a dummy variable that equals 1 for the first eight quarters of each Democratic incumbent's term and 0 in all other periods. This specification allows the first half of Republican and Democrat administrations to each have a unique intercept.

There are six OTHER variables in my models. Three are dummy variables to account for the credit controls imposed in 1980 by Jimmy Carter, and three are quarterly dummies to account for any residual seasonality in the data. These six variables are taken directly from FI.

4 Data and results

I begin by testing for the optimal number of lags to use when including the economic variables in the equation. I considered lag lengths from two to eight. Both the Akaike Information Criterion (AIC) and the "maximal adjusted R2" criterion pick four as the optimal lag length.[11] In addition, I test each variable to find its level of marginal significance in the equation. The lags of money growth are jointly significant at the 0.002 level, the lags of inflation at the 0.012 level, the lags of interest rate changes at the 0.027 level, and the lags of energy price growth at the 0.077 level. Only the lags of government spending growth were insignificant, with a p-value of 0.78. Replacing the growth of government spending with the level of spending did not improve the fit of this variable (or alter the optimal lag length). Based on this pre-testing, the exact model to be used here is either given by:

$$\begin{aligned}\Delta \ln(Y_t) = \delta &+ \sum_{i=1}^{4} \beta_i \Delta \ln(Y_{t-i}) + \sum_{i=1}^{4} \lambda_i \Delta \ln(P_{t-i}) + \sum_{i=1}^{4} \theta_i \Delta \ln(R_{t-i}) \\ &+ \sum_{i=1}^{4} \Theta\beta_i \Delta \ln(M_{t-i}) + \sum_{i=1}^{4} \Phi_i \Delta \ln(E_{t-i}) \\ &+ \gamma_1(\text{ELEFULL}_t) + \gamma_2(\text{First}_t) + \gamma_3(\text{First} * \text{Dem}_t) \\ &+ \phi_1(\text{DQ1}_t) + \phi_2(\text{DQ2}_t) + \phi_3(\text{DQ3}_t) + \phi_4(\text{D80Q2}_t) + \phi_5(\text{D80Q3}_t) \\ &+ \phi_6(\text{D80Q4}_t) + \varepsilon_t \end{aligned} \tag{2}$$

or by (2), which simply replaces ELEFULL with ELE6.

Using 4 lags of each economic variable and one opportunistic PBC variable along with the partisan and "other" variables, means that there will be a total of 34 regressors in the equation. This large number of right-hand-side variables makes reporting the full results of each regression unwieldy. For this reason the tables in the text will be abridged, reporting only on the variables of interest. Copies of the full results are available upon request. Again, the data used are quarterly from 1961.1 to 2004.4, for a total of 176 observations on 11 complete election cycles.

[10] This V shaped dummy variable was originally used by McCallum (1978) and is also used by Grier (1987, 1989). Krause (2005) uses a variable equivalent to the second half of the V.

[11] However, the results found in support of the PBC do not depend on the choice of lag length.

Table 1 Political influence on US real GDP growth: 1961–2004

	EQ1	EQ2
Variable	Coefficient (T-stat)	Coefficient (T-stat)
FIRST	−2.142	−0.674
	(4.12)	(0.99)
FIRSTDEM	3.313	3.202
	(4.52)	(4.30)
ELEFULL	0.267	–
	(3.86)	
ELE6	–	2.163
		(3.34)
Adj. R2	0.389	0.334
AIC	4.93	5.01

Note: Models also include an intercept, four lags of each economic variable discussed in the text, three credit control dummies, and three seasonal dummies. Numbers in parentheses are the absolute values of robust T-statistics (see Newey and West 1987). The temporary partisan variables are jointly significant at the 0.01 level in both equations

4.1 Basic tests for electoral effects

Table 1 reports my basic results which show that both opportunistic PBC variables are positive and significant at the 0.01 level. Equation A implies that, ceteris paribus, output growth is around two percentage points higher than it otherwise would be in the year and a half preceding the election. Equation B, which uses the 16-quarter V-shaped variable, implies that the trough to peak electoral swing in output growth is around 2.1 percentage points.[12] The temporary partisan variables are also correctly signed (Republican first halves exhibit lower growth than Democrat first halves) and jointly significant at the 0.01 level. These results confirm formally what appears graphically in Fig. 1. In partial contrast to the work of Alesina et al. and in almost complete contrast to the work of FI, the US data show strong statistical evidence of both partisan and opportunistic electoral effects over the last 11 election cycles. This is the first paper to show such a result for the United States while controlling both for temporary partisan effects and long lags of various macroeconomic variables.

When deciding which PBC variable is to be preferred, it should be noted that while both are significant at the 0.01 level, the adjusted R-squared is around 16% higher for the equation with ELEFULL, and this equation is also preferred by the AIC criterion. Initially, then, the ELEFULL version of the cycle (16 quarter V shape) is preferred over the pre-election jump version (ELE6). The next subsection considers the stability of these equations and especially the stability of the coefficients on the PBC variables over the course of the sample.

4.2 Robustness of the opportunistic PBC effect

It has been argued that perhaps there is evidence of opportunistic PBC behavior on rare occasions, the 1972 re-election campaign of Richard Nixon being especially notorious, but no systematic evidence of pervasive effects. Here I address this issue by investigating the stability of the equations reported in Table 1 above, especially the stability of the opportunistic PBC coefficients.

[12] I relax the assumption that the V is symmetric by estimating separate coefficients for the downward and upward halves. However, the null of symmetry is not rejected by the data, even at the 0.10 level.

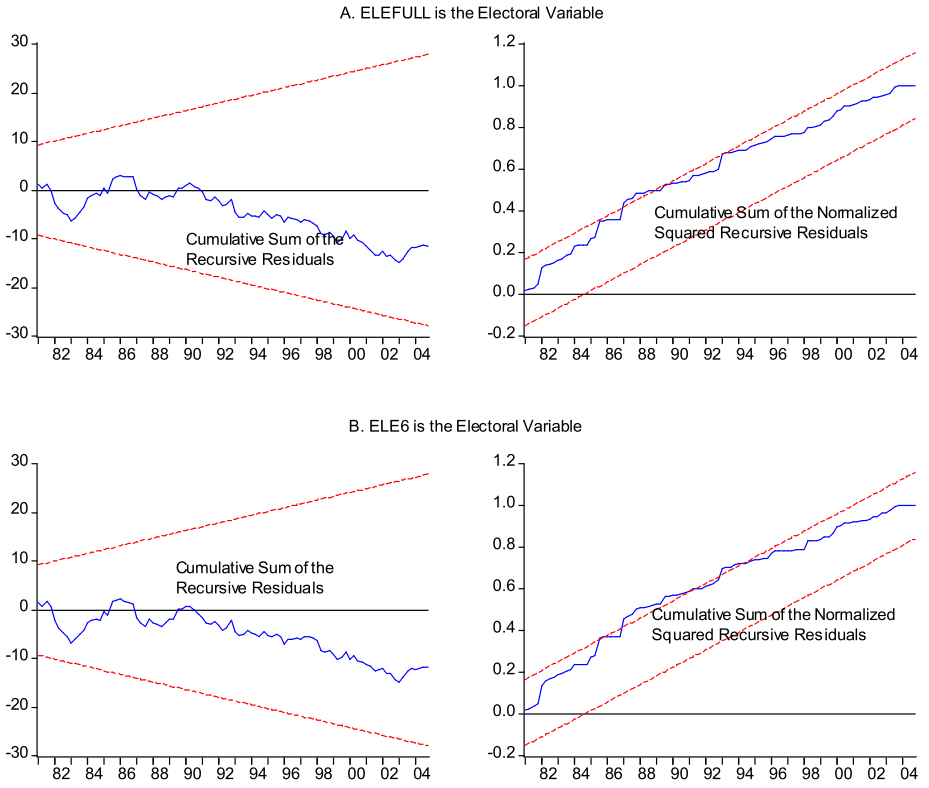

Fig. 2 Stability tests for the equations in Table 1

Figure 2 presents two stability tests based on the recursive residuals from each equation in Table 1. The tests are due to Brown et al. (1975) and are called colloquially the CUSUM and CUSUM-of-squares tests. In the CUSUM test, parameter instability is indicated by the cumulative recursive residuals straying outside their confidence intervals around their expected value of zero. In the CUSUM-of-squares test, movement of the weighted squared cumulative residuals away from their expected value, which moves from zero to one across the sample is indicative of parameter instability. In panel A of Fig. 3, there is very little evidence of parameter instability in the equation where the PBC is represented by the ELEFULL variable. In panel B there is perhaps a bit more evidence against parameter stability in the CUSUM-of-squares test for the equation with ELE6 as the opportunistic PBC variable.

To investigate the electoral coefficients more specifically, I create a series of dummy variables that split the sample at 1977.1, 1981.1, 1984.1 and 1989.1 and estimate regressions that allow the coefficients on ELEFULL and ELE6 to differ before and after the chosen date.[13] These results are reported in Table 2. Again, there is no evidence of any instability in the ELEFULL coefficient as each of the 4 slope shift variables is completely insignificant. There is a bit of a suggestion of instability in the ELE6 coefficient when it is allowed to shift in 1979 or 1981 as the slope shift variable is positive and significant at the 0.10 level.

[13] I do not consider earlier or later breaks as doing so would make one of the two sub-samples extremely small, with only 3 or fewer elections included.

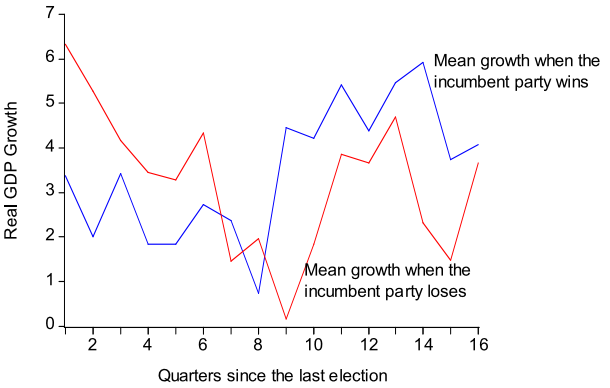

Fig. 3 Mean real GDP growth by quarter of the election cycle and outcome of the election, 1961–2004

Table 2 Stability tests for the electoral coefficients in Table 1

Variable	Coefficient	Variable	Coefficient
Breakpoint			
1977.1			
ELEFULL	0.273	ELE6	1.491
	(3.09)		(1.85)
ELEFULL∗SHIFT	−0.010	ELE6∗SHIFT	0.916
	(0.15)		(1.48)
1981.1			
ELEFULL	0.258	ELE6	1.459
	(2.82)		(1.88)
ELEFULL∗SHIFT	0.016	ELE6∗SHIFT	1.107
	(0.18)		(1.84)
1985.1			
ELEFULL	0.277	ELE6	1.797
	(3.39)		(2.45)
ELEFULL∗SHIFT	−0.023	ELE6∗SHIFT	0.513
	(0.27)		(0.89)
1989.1			
ELEFULL	0.301	ELE6	1.882
	(3.79)		(2.71)
ELEFULL∗SHIFT	−0.095	ELE6∗SHIFT	0.445
	(1.00)		(0.81)

Interestingly though, the shift variable reveals that the PBC has been getting stronger since the 1970s rather than weaker, as the "only Nixon did it" hypothesis would have it.

This subsection demonstrates two things. First, on the whole, there is not much evidence of parameter instability or any serious specification problems with these equations. Second, on the margin, we see a bit more evidence that the full electoral cycle variable ELEFULL may be preferred to the pre-election jump variable ELE6.

Table 3 Does the opportunistic PBC vary by outcome? 1961–2004

Variable	EQ A1 Coefficient (T-stat)	EQA2 Coefficient (T-stat)
FIRST	−0.78	−2.14
	(1.14)	(3.99)
FIRSTDEM	3.25	3.30
	(4.31)	(4.43)
ELE6	2.32	–
	(3.23)	
ELE∗LOSE	−0.59	–
	(1.16)	
ELEFULL	–	0.26
		(3.72)
ELEFULL∗LOSE	–	0.01
		(0.10)
Adj. R2	0.384	0.385

Note: Models include four lags of all the macroeconomic variables, the seasonal dummies, the credit control dummies and the temporary partisan dummies. Numbers in parentheses are the absolute values of robust (Newey-West) T-statistics. The temporary partisan variables are jointly significant at the 0.01 level in both equations

4.3 Does the PBC vary by outcome?

In Persson and Tabellini's (1991) PBC model there can exist a separating equilibrium where competent incumbents signal to voters their ability to govern by creating a cycle that would be too costly for an incompetent incumbent to engineer. In this section I examine this possibility. Figure 3 compares output growth over the cycle between the six elections where the incumbent party wins and the five where it loses. While a cycle is visible in each case, the winning party cycle appears much stronger. On average output growth is higher in every quarter during the last half of the term following elections when the incumbent party wins. Over the second half of the cycle growth averages 4.71% when the incumbent party wins and only 2.71% when it loses. This difference is significant at the 0.01 level ($t = 3.32$). If the winning incumbents are the competent incumbents, this is crude, but sizeable, evidence in favor of the Persson-Tabellini approach. In Table 3, I further examine this phenomenon in the context of multiple regression. I interact the two opportunistic PBC variables with a dummy variable LOSE, which equals 1 for election terms where the incumbent party eventually loses the election and 0 for terms where the incumbent party wins the election. As can easily be seen from the table, once the macro and other control variables are accounted for, the difference in output growth over the election cycle between winning and losing campaigns that appears in Fig. 3 disappears. In other words, once ceteris paribus conditions are imposed, there is no significant difference between winning and losing incumbent parties, at least in terms of the coefficients on the opportunistic PBC variables.

This finding, combined with the information in Fig. 3, means that, in all likelihood, the time path of one or more of the control variables differs across winning and losing incumbent parties. A preliminary inspection of the data indicates that real money growth, which is a linear combination of two of my regressors (money growth minus inflation), is a possible candidate. As shown in Fig. 4, real money growth is on average higher in every quarter during the second half of a presidential term when the incumbent party wins.[14] Over the

[14] Abrams and Iossifov (2006) argue that the Fed conditionally contributes to the PBC in the US.

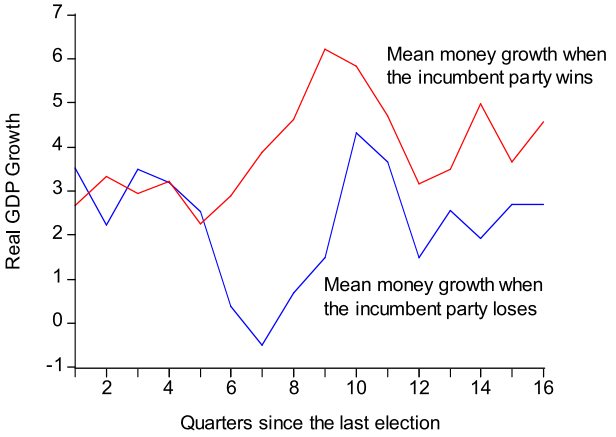

Fig. 4 Mean real M2 growth by quarter of the election cycle and outcome of the election, 1961–2004

second half (last 10 quarters) of the cycle, real M2 growth averages 4.57% (4.50%) when the incumbent party wins and 2.59% (2.10%) when it loses. The difference is significant at the 0.01 (0.01) level with a t-statistic of 3.75 (4.42).

Thus we see that there is a difference between the electoral cycles of winning and losing incumbent parties and this difference is related to real money growth over the cycle, which is consistent with the Persson-Tabellini model. However, this result is only meant to be suggestive; a more complete study of PBC effects in the United States is deferred for future research.

4.4 A simple effort to endogenize the rational partisan variable

As noted in Sect. 2, the Faust and Irons endogeneity critique does not apply to my opportunistic PBC variables. The timing of US elections is fixed and exogenous. However, it clearly does apply to the temporary partisan variables. Given that there are relatively few observations on this outcome, it difficult to endogenize this variable.

Here I create a 12-observation sample (using the 2004 election as well), where the dependent variable is equal to 1 if the Democrat candidate wins the election and equal to zero if not. I then estimate a probit model predicting Democrat victories and use the predicted probability as an instrument for the DEM dummy variable in the GDP growth regressions. The regressors employed in the probit are a dummy for whether or not the incumbent president is a Republican, a variable for how many four-year terms have passed since a Democrat was president and a quadratic trend. These regressors are simplistic and perhaps a theoretic, but I am trying to avoid variables that would potentially be endogenous to GDP growth in order to create a valid instrumental variable. The estimated equation correctly predicts 11 of the 12 elections and the predicted probability of a Democrat win ranges from 0.9 to 0.03. I take each election probability and use it eight times for the first eight quarters of the relevant election cycle, creating an instrument for the variable FIRSTDEM.[15]

The instrumental variable results are presented in Table 4. In the second column, where ELEFULL is the opportunistic variable, we see that the coefficient on FIRSTDEM is now 17% smaller than the one estimated by least squares and reported in Table 1. Its significance

[15]Given the mismatched nature of the samples (12 observations in the probit, 176 in the second stage), there is not a clear cut way to estimate both equations simultaneously.

Table 4 TSLS models of US real GDP growth allowing for the endogeneity of the winning Party (FIRSTDEM) 1961–2004

Note: Models include an intercept, four lags of each economic variable, three credit control, dummies, three seasonal dummies. The instrument used to identify FIRSTDEM is the probability of a Democrat winning the election (based on a probit equation using republican incumbent, terms since a democratic president and a quadratic trend as described in the text)

Variable	EQ 1 Coefficient (T-stat)	EQ2 Coefficient (T-stat)
FIRST	−0.70	−1.91
	(0.82)	(2.65)
FIRSTDEM	3.01	2.82
	(2.49)	(2.34)
ELE6	2.02	–
	(2.51)	
ELEFULL	–	0.25
		(2.49)
Adj. R2	0.386	0.387

level has also fallen from 0.01 to 0.05. However, the model still supports the existence of temporary partisan effects, and the ELEFULL coefficient is little changed (5% smaller) and still significant at the 0.05 level. In the ELE6 regression, both the FIRSTDEM and ELE6 coefficients are slightly smaller (about 6% each), but both are positive and significant at the 0.05 level. While this clearly not the last word on the subject of endogeneity in political economy models, the chosen instruments are reasonable and the results are supportive of the existence of partisan effects even allowing for their endogeneity.

4.5 Why don't FI and Alesina et al. find what I find?

As noted, these results are the first in the literature that show a PBC while accounting for the critiques of previous work offered by Alesina et al. and FI. I use a combination of their methods and find what they fail to find, so it is useful to consider why that might be. In the case of FI, I believe my findings differ because I use a few simple intuitive political variables instead of a very large number of dummy variables.[16]

My results differ from Alesina et al. because they do not employ the wide range of macro control variables advocated by FI, but rather use only lags of income growth. Somewhat ironically then, by combining the best statistical parts of the two most influential arguments against opportunistic PBCs, I am able to produce strong evidence in favor of opportunistic PBC phenomena in the USA.

5 Discussion

Lewis-Beck (1988) sets out the following paradox. If the economy influences the vote (which it does) and politicians want to be re-elected (which they do) how can there not be an opportunistic PBC? The current answer offered by the economics literature is that given the structure of the economy, it is simply too costly for politicians to engineer such cycles. In

[16]My method is justifiable because, at least in the case of ELE6 and the temporary partisan variables, the variables I use are consistent with existing theories. The *V* shaped variable is simply one that has a long tradition of use in the PBC literature.

this paper I argue that the paradox is answered for the United States by noting that there *is* a political business cycle. From 1961 to 2004, there is robust statistical evidence of sizeable opportunistic PBC effects in US real GDP growth. There is also evidence of partisan PBC effects that survive a simple correction for endogeneity.

A second, entirely reasonable, response to these results may be to ask what is the mechanism that drives the observed cycle? First, it is important to realize that the main point of the paper is to convince the reader that there really is a cycle. Second, we have shown some evidence that the cycle differs between winners and losers and that the mechanism may well be real money growth. This is a promising avenue for future research.

However, the main result of the paper shows that controlling for money, prices, inflation, interest rates, energy prices and lagged growth there is a significant opportunistic cycle. The implication is that some other factor presumably is causing the PBC. One possibility is that there is some, still omitted, variable that drives the cycle. Perhaps other types of fiscal variables might be more effective than the ones considered here.[17] Another possibility is that electoral cycles occur when the inflation-controlling policies of the Fed are consistent with the electoral incentives of the President. The implication for future research would be to develop a model that explicitly treats Presidential-Fed interaction, which has not been examined here (as is traditional in the PBC literature). My hope is that these results, by presenting a new set of stylized facts that an acceptable theory must explain, generate new interest in the theory of the PBC and spark the development of new theoretical political economy models.

Data Appendix

	Variables:					
	DLY	DLM	DLFF	INF	DLPE	DLGOV
Mean	3.387	6.873	−0.371	3.726	0.691	1.403
Max	15.45	21.22	190.90	12.17	40.20	26.52
Minimum	−8.15	−1.13	−197.6	0.404	−47.14	−22.17
Std. Dev.	3.37	3.383	54.27	2.465	11.508	7.917

Note: All numbers are annualized growth rates. Monthly data is first converted to quarterly by averaging before calculating the growth rates (calculated as change in the natural log multiplied by 400). The huge swings in the fed funds rate shown by the very large minimum and maximum growth rates are what prompted FI to include the credit control dummies in their regressions.

Appendix: Looking for the PBC in (de-trended) income levels

As noted in the main text, the macroeconomic series employed here fail standard stationarity tests and do not appear to be co-integrated. In this case, the statistically proper procedure is to difference the series (removing the stochastic trend) and study short-run relationships between the growth rates. In addition, Fair (1998) has shown that income growth is the economic variable that best predicts presidential voting.

[17] As noted earlier, government spending variables were included in the analysis, but dropped due to insignificance. Keeping them in does not change any of the main results presented in this paper.

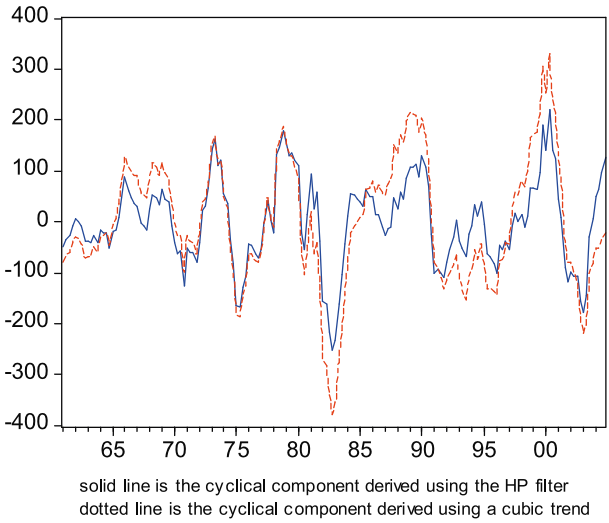

Fig. A.1 two measures of the cyclical component of RGDP

However, these unit root and co-integration tests are not extremely powerful and many studies, especially in the real business cycle literature, study de-trended output levels. Here I consider how the political variables developed in the text above affect de-trended levels of real output. I consider two different methods of de-trending. The first is to use the Hodrick and Prescott (1997, hereafter HP) filter to split each series into trend and cycle components, as is commonly done in the real business cycle literature and then to estimate models similar to those in the text on these filtered series.[18] The second method is to estimate models in the levels of the series but to also include a polynomial in time to capture possibly non-linear trends. I consider up to fourth-order polynomials and find that a cubic trend best fits the real GDP data.

Figure A.1 compares the two methods of obtaining cyclical or de-trended real GDP. As can be seen, the two series are broadly similar, with the cubic trend method producing a bit more volatile series. The linear correlation between the two is 0.89. In what follows below I concentrate on the results using the HP filter to generate cyclical real GDP, though the regression results also hold up if one uses a linear, quadratic, or cubic term to de-trend instead of the HP filter.

Figure A.2 is the analog of Fig. 1 in the main text, and shows that average de-trended (via the HP filter) real GDP displays the same general PBC pattern as did the growth rates. Cyclical output declines for ten quarters after an election, then rapidly rises for the remaining six quarters. It is important to remember that these data are net of the HP filter so there is no mathematical relationship between these levels and the growth rates analyzed in the main text. The turning points can be, and indeed are, different, but the general result is the same.

Table A.1 reports estimating multiple regressions where the cyclical component of real GDP is regressed on four lags of the cyclical components of itself, M2, the price level, relative energy prices, the Fed funds interest rate, along with the political and "other" variables

[18] I thank John Freeman for suggesting this approach to me. The HP filter creates a smoothed series by minimizing the variance of actual series around the smoothed path subject to a constraint that penalizes abrupt movements in the smoothed series. I set the smoothing parameter to 1600 as recommended by Hodrick and Prescott for quarterly data. Here we are studying the deviations of the series from the smoothed path as the business cycle, or non-trend component.

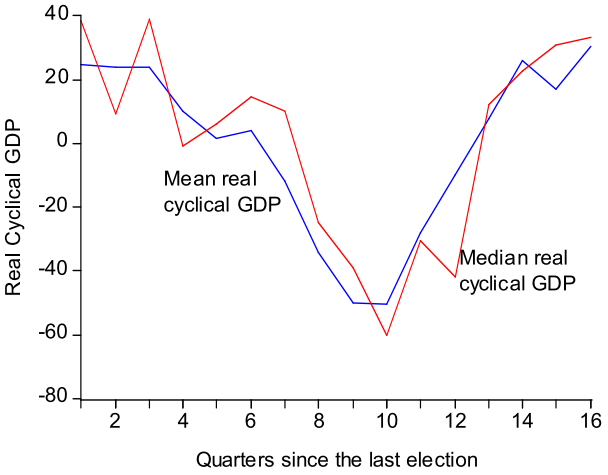

Fig. A.2 Mean and median of cyclical RGDP by quarter of the election cycle, 1961–2004

Table A.1 Political Influence on US real cyclical GDP: 1961–2004

	EQ1	EQ2
Variable	Coefficient	Coefficient
	(T-stat)	(T-stat)
FIRST	−3.28	15.12
	(0.38)	(1.39)
FIRSTDEM	10.66	10.48
	(1.16)	(1.16)
ELEFULL	3.348	–
	(3.17)	
ELE6	–	29.49
		(2.99)
Adj. R2	0.867	0.869
AIC	9.98	9.96

Models also include an intercept, four lags of the cyclical components of each economic variable discussed in the appendix, three credit control dummies, and three seasonal dummies. Numbers in parentheses are the absolute values of robust T-statistics (see Newey and West 1987). The temporary partisan variables are jointly significant at the 0.01 level in both equations

described in the main text above. As before, I report only the coefficients of interest to save space; complete results are available upon request. As can be seen in the table, both ELE6 and ELEFULL are positive and significant at the 0.01 level. The coefficient on ELE6 indicates that, other factors held constant, the six-quarter electoral period is associated with an income level about $30 billion greater than what it otherwise would have been. The coefficient on ELEFULL implies that the trough to peak increase in real cyclical GDP is around $28 billion. The only substantive difference in the political variable results when using the cyclical level of real GDP is that the temporary partisan variables are now insignificant, both individually and jointly.

Finally, I have run regressions using the raw levels of the macro variables including either a linear, quadratic, or cubic trend. In all cases the PBC variables under study in this paper have positive and significant coefficients.

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